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Ontario
Ministry of Energy

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is a supplement to the May/June issues of:
Building Owner & Property Manager, The Canadian Architect, Electrical Equipment News, Heating, Plumbing & Air Conditioning and Canadian Consulting Engineer.

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Printed on recycled paper.

CONTENTS

Spotlight on Ontario's Energy Picture

THE DEVELOPMENT OF KEY PARTNERSHIPS THROUGH A VARIETY OF MINISTRY OF ENERGY PROGRAMS IS MAKING ONTARIO A TREND-SETTER IN ENERGY EFFICIENCY.

Energy is very important to us, and to our standard of living. We need energy to provide services for heating, cooling, transportation, manufacturing processes and more.

But what a difference a decade makes. Today, people look at energy use in a whole new light.

For instance, we are much more aware of the environmental consequences of our energy use, and understand the link with acid rain, ozone depletion and global warming.

Security of supply is no longer a worry with world-wide excess of oil and natural gas. But we are vulnerable in today's deregulated market, as prices are determined in the continental and international markets. This means Ontario is susceptible to price shocks as a result of instability elsewhere in the world. For electricity, there is increasing concern about the cost and risk of building large megaprojects.

L-R: Brian Charlton, acting Minister of Energy; Brian Kipping, Vice President, McCain Refrigerated Foods Inc.; Gary Reid, Plant Manager, McCain.

Our economy is under increasing pressure from free trade, an increased exchange rate, international competition, and the recession. Thousands of jobs have been lost and restructuring is being forced on many firms and industries. Faced with these challenges, using energy more efficiently can help us produce goods and services at lower cost and create jobs.

In 1990, Ontario's wholesale energy bill was $14 billion. A steady growth in Ontario's population over the next decade, through birth rates and immigration, will mean greater pressure on meeting future energy needs.

Conserving energy and using it efficiently is the way of the future, and the Ministry of Energy is working to make Ontario a global trend-setter in energy efficiency.

The key to success is establishing strong partnerships across the province. The Ministry's emphasis on cultivating partnerships with communities, business and industry has brought energy matters right to our front door.

"Individuals are now taking ownership of energy matters at a grassroots level, and it's exciting to see communities, institutions, businesses and industries working together with the Ministry of Energy," says Brian Charlton, acting Minister of Energy. Some of the most notable examples of this grassroots involvement can be seen through the Cities Energy Forums and the Ministry's Energy-Efficient Communities program.

New and improved technological advances have been made recently which offer dramatic improvements in the reduction of energy demand and

consumption through applications in lighting, motors, control systems, heating and cooling systems, and the building envelope. The Ministry has developed programs, such as the Market Entry Efficiency Technologies (MEET) program, that support the manufacturers and users of these new technologies.

Through programs like EnerSearch®, Ontario also assists in research and development through strong financial investment in companies and manufacturers that design and manufacture energy-efficient products. This leads to job creation, and has assisted our industries in exporting their products around the world.

Ontario's Energy Efficiency Act leads the way nationally by ensuring that specified new household appliances and other energy-using products sold or leased in Ontario meet minimum energy efficiency standards.

These standards are developed at recognized organizations such as the Canadian Standards Association (CSA) and the Canadian Gas Association (CGA). The technical committees of these organizations include representatives of manufacturers, retailers, consumer associations, utilities and the federal and provincial governments.

The standards also contain the testing criteria and methods used to determine an appliance's efficiency.

Minimum efficiency standards are now being developed for products such as fluorescent lighting ballasts, gas water heaters, ice-making and commercial refrigeration equipment. Several key product areas already have regulated minimum standards, such as gas furnaces, building air conditioners and motors.

Ontario's New Energy Directions policy, announced in 1990, stresses that energy efficiency and conservation are the top priorities for meeting energy services.

"I'm proud of this Ministry's programs," Charlton says. "The successful partnerships between the Ministry, communities, institutions, industry and business will go a long way in helping us become a leader in energy efficiency by the year 2000." ■

- PUBLICATIONS -

The Ministry is getting its message across through a number of consumer publications:

1. Energy Matters - *a fun-filled activity book for kids*
2. Cut your Energy Bills up to 20%
3. Consumer Guides
   - Home Heating & Cooling
   - Energy-Efficient Windows and Doors
   - Energy-Efficient Appliances and Lighting
   - Energy-Efficient Resale Homes
4. Program Kits - *descriptions of each program*
5. How To...
   - Caulk & Weatherstrip
   - Insulate Basements
   - Provide Fresh Air & Humidity Control in a Tighter House
   - Improve Fireplace Efficiency
   - Install Air-Vapour Retarders
6. Fascinating Facts
7. Energy and the Environment
8. EnerFacts:
   - Heating With Wood
   - UFFI and You
   - The Greenhouse Effect and Global Warming
   - Home Insulation Materials
   - Renewable Energy
   - Active Solar Heating
   - Passive Solar Heating
   - Photovoltaic Solar Heating
   - Wind Energy
   - Small Hydro
   - Alternative Transportation Fuels
   - Biomass Energy

You're invited to join in our energy partnerships. For further information about the programs and publications offered by the Ministry of Energy, contact us at:

Ontario Ministry of Energy
56 Wellesley Street West,
9th Floor,
Toronto, Ontario
M7A 2B7

or call us at 1-800-ENERGY1

Taking it to the streets

COMMUNITY INVOLVEMENT IS THE CORNERSTONE OF VARIOUS MINISTRY OF ENERGY PROGRAMS.

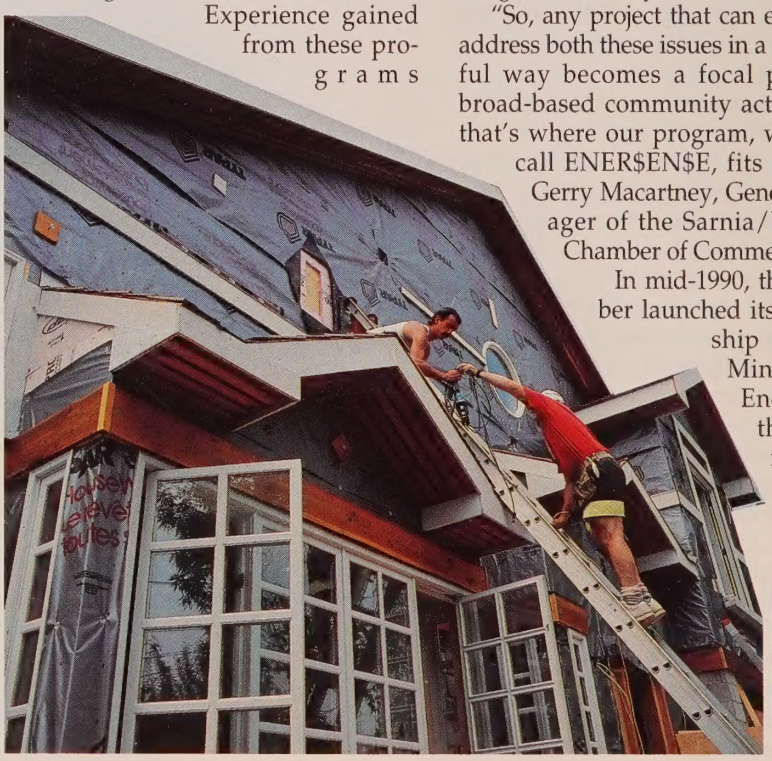
Three Ontario communities are participating in a unique pilot project through the Ministry of Energy as 'Energy-Efficient Communities'.

Cornwall, Atikokan and Sarnia have launched a range of energy-efficient initiatives that are custom-made for each community. With much enthusiasm and even a little good-natured competition, each community is gaining support from local utilities, business, industry and the private sector.

The objective of the project is to encourage communities to achieve their own energy efficiency goals through local initiatives.

With guidance, training and financial assistance provided by the Ministry of Energy, local residents are planning and implementing community-based programs and energy-efficient activities geared to their needs.

Experience gained from these programs will be used to develop a menu of activities which other communities can adapt to their own situation. The ultimate goal is to motivate community spirit throughout Ontario to improve energy-efficiency at the grassroots level.



SARNIA

Lambton County, which includes Sarnia, is one of the highest per capita consumers of energy in Ontario.

Often called 'Chemical Valley', the area is home to world-scale refineries and petrochemical plants.

Although long term security of energy supplies is a high priority in Lambton County, of equal importance is pollution abatement. The petrochemical industries in Sarnia are world leaders in their efforts to reduce emissions of pollutants in the air and the St. Clair River, but the legacy of the past still hangs over the city.

"So, any project that can effectively address both these issues in a meaningful way becomes a focal point for broad-based community action. And that's where our program, which we call ENERENE, fits in," says Gerry Macartney, General Manager of the Sarnia/Lambton Chamber of Commerce.

In mid-1990, the Chamber launched its partnership with the Ministry of Energy in the Commercial Buildings Energy

Conservation Management Program, and the annual Cities Energy Forum.

"We suggested to the Ministry that our community would be an excellent candidate for an all-out effort at energy conservation because of the area's priorities," Macartney says. "And when the Ministry announced its Energy-Efficient Communities Pilot Program in June of 1991, it was no surprise that a group representing a broad cross-section of interests in this area quickly assembled to brainstorm our proposal to be one of three chosen communities."

The Centre for Entertainment & the Environment, wishing to show positive action towards their goal of a major showplace in Sarnia, volunteered to coordinate the project. Peter Henderson, Executive Director for the Centre, was chosen as spokesman. Macartney, another driving force in the community, was appointed chair of the Energy Advisory Committee. The Sarnia/Lambton Economic Development Commission agreed to be the host recipient and administrator of $600,000 in funds for the first year of the project.

The Sarnia/Pt. Edward Energy Conservation Project adopted the following objectives:

1. To make Sarnia/Pt. Edward the leader in Ontario in showing the way to reduce energy consumption, improve the environment, and save residents money.

2. To ensure the extended availability of low-cost reliable energy sources for power and feedstocks for the area's industries and its citizens.

3. To highlight The Centre for Entertainment & the Environment as part of its total involvement in making Sarnia/Pt. Edward a centre of environmental excellence.

4. To achieve up to a 20% reduction in all forms of energy consumption (excluding feedstocks) over three years and a similar reduction in electrical peak demand. This is to be achieved at affordable cost while sustaining or improving the environment and lifestyle.

Project elements include energy efficiency campaigns through seven sectoral committees and an energy conservation educational campaign conducted by an 'InfoEd' committee. The seven sectors include:

- private and multi-residential buildings
- government and institutional facilities (including hospitals, churches, social agencies and seniors' homes)
- educational facilities
- hotels and motels
- commercial facilities
- industrial facilities and process energy consumption
- transportation

A number of steering committees were set up to recommend programs, schedules and budgets for each sector, and the result has been even broader involvement of the community.

Barney Withers, who works on the Commercial Buildings Program for the Chamber, was hired to help the Advisory and Sectoral committees develop and coordinate their programs. Although it has taken longer to develop programs through the large committee structure, the result has been a series of customized activities unique to each sector, designed to achieve real long-term energy savings.

The major effort to date is the Residential Project, which targets 750 to

1,000 houses for audits, weatherizing and retrofitting this year. Two ENERENE technical advisers will conduct audits, and contractors will weatherize the homes. These contractors are being trained by Lambton College to National Energy Conservation Association (NECA) standards. A series of public information seminars were conducted to show residents what they can do in their homes to save energy.

In many of the sectors, there will be training seminars for building operating staff to make them aware of good energy practices, followed by ongoing tracking of their energy consumption to maintain interest.

"Overall, the ENERENE Project is well on its way," Macartney says. "All of us involved have found it a rewarding experience, realizing the potential that can be achieved through volunteers working together to benefit ourselves, our community, our workplace and our environment."

ATIKOKAN

A community of 4,100 people situated 120 miles west of Thunder Bay, Atikokan is typical of small northern centres across Canada. And, it's an ideal site for a demonstration in energy conservation: information gained here is applicable to northern communities elsewhere.

A board of eight members was set up as a 'branch plant' operation of the Economic Development Commission Office (EDC). The board is made up of representatives from EDC, township council, Atikokan Hydro, Centra Gas and the general public.

"We operate a storefront office staffed with a full time administrator," says Owen Lindsay, Chair of the Atikokan Energy Conservation Committee. "This office is the focal point of our activities.

"The storefront has many energy-saving displays: a water-saving shower head, no-draft dryer vent, new style draft-reducing outlet boxes, and samples of insulation and weatherstripping. We also have a display of energy-efficient fluorescent lighting, as well as a high tech window display."

The office distributes literature dealing with energy efficiency and video tapes dealing with the 'why' and 'how to' of energy conservation may be viewed in-store or signed out for home viewing.

"We are formulating plans for the continuing education of the general public and, where possible, working with children via poster and science fair projects," Lindsay adds.

Some 250 homes will undergo an energy audit; 125 of them will be weatherized.

"To assure a quality job, we contracted with NECA to train 13 local residents to carry out the work," Lindsay says. "As the scope of our program expands, we plan on increasing the capabilities of our trained crew."

Although the home weatherization project is a priority, the program will work closely with the retail, manufacturing and institutional sectors of the community to arrange power audits of buildings, lighting and heating systems.

"We are securing tremendous support from the Ministry of Energy, Ontario Hydro and Centra Gas," he adds. "This cooperation has been crucial to our success to date."

The committee, in conjunction with Ontario Hydro and Centra Gas, is conducting energy audits for homes, businesses and industry. Once these audits are completed, owners are made aware of what must be done to cut energy costs. Usually, a payback period is indicated for each energy-saving suggestion.

"Working with Ontario Hydro and Atikokan Hydro, we anticipate we will be able to do a community-wide power saver audit," Lindsay says. "Our overall objective is to make Atikokan 'the centre of excellence in energy conservation'."

CORNWALL

Cornwall's Energy Efficiency Team has put together a multi-faceted program. The team consists of: Centra Gas, Cornwall Electric, City of Cornwall, Chamber of Commerce, Kiwanis Club, Rotary Club, and the public and separate school boards.

Since it was formed in July of 1991, the team has been busy developing a number of activities, such as two energy efficiency seminars in conjunction with the Chamber of Commerce Home & Trade Show.

"One seminar related to commercial and industrial sectors, while the other was a student leaders' seminar for secondary school students," says Ron Eamer, committee chairman. "Both were very successful."

A select group of local utility representatives, building and renovation contractors also received training through the program.

In addition, a program coordinator, Cy Page, was hired. There are presently 13 employees working on team activities, and they plan to respond to requests for their services in a reasonable length of time.

Just this year, the program's residential activities began, involving the weatherizing of 500 homes. A further 2,500 homes are receiving a home 'tune-up'.

The weatherization program includes air sealing of homes to prevent infiltration of cold air while the tune-up involves the installation of products designed to reduce the customer's energy cost.

"The response during the initial stages of our project has been most gratifying, with full and enthusiastic support coming from many segments of the community," Eamer says.

The team is concerned with improving Cornwall's energy efficiency in all sectors, and will continue to develop programs of benefit to the community throughout the three-year term of the project.

"We urge individuals or organizations who may have ideas or suggestions related to our activities to contact us at (416) 933-0000," Eamer adds. "An increased level of energy efficiency in our industries, our businesses and our homes will help us all." ■

In Partnership With Business

GRASSROOTS INVOLVEMENT THROUGH LOCAL BUSINESS GROUPS HAS BROUGHT THE MESSAGE OF ENERGY EFFICIENCY TO THE COMMUNITY LEVEL ACROSS ONTARIO.

Energy management information that has not been available to most building owners and managers before is now being offered free of charge to those with annual energy costs in excess of $10,000. The information source is the Ministry of Energy's Cities/Downtown Energy Forums and Outreach Program.

In 25 large and 30 smaller communities across the province, a local group such as the Chamber of Commerce coordinates and monitors the program, which provides technical advice to encourage owners and managers of buildings to practise effective energy management. Inaugural one-day seminars offer an overview of the potential for saving energy and money, and the Ministry funds annual 'Cities Energy Forums' to foster the exchange of ideas among program participants.

In Toronto, the Building Owners and Managers Association (BOMA) has entered into a three-year agreement with the Ministry to coordinate its local program. With 100 buildings totalling 40 million sq. ft., the BOMA Toronto effort is the largest in the province.

Through the program, a participant's monthly use of energy — steam, gas, oil or hydro — can be monitored and summarized annually to indicate kWh/sq. ft. used, according to George Bull, energy coordinator for BOMA Toronto.

Buildings are divided into classes based on size and/or use. For instance, Bull explains, the office building class is further subdivided according to size, but all hotels are in a single class.

"We can generate an average energy use for each building class, so pro-

Small tabletop trade shows at the Cities Energy Forums allow suppliers to display new products and services.

gram participants can compare their usage to (that of) other buildings in their class," Bull says, adding that there are many causes for higher-than-average levels, ranging from the inefficiencies of "a lousy (HVAC) system" to the requirements of a large number of computers. If comparison to buildings in the same category indicates high energy consumption, and the owner or manager is interested in going further with the program, potential causes may be discussed at a subsequent meeting.

Technical advice is provided by a local energy coordinator and an advisory committee made up of representatives from Ontario Hydro, local utilities, industry, technical associations, building owners and managers and business improvement associations.

After technical advisers tour the building, they make recommendations on how to improve energy efficiency.

"The owners don't have to take our advice," Bull says, "but with energy prices going up, it makes sense to try to reduce energy consumption."

Conservation efforts by participants are supported through training material, technical manuals and case studies, as well as by discussion generated at the annual 'Cities Energy Forums', such as Toronto's 'Downtown Energy Forum' at which the advisory board of BOMA members analyzes a building's potential for conservation. And in return for its financial and technical support, the Ministry receives energy-related information that the local coordinators gather from participants.

The Sarnia/Lambton Chamber of Commerce was particularly interested in the program because that area has the largest per capita consumption of all forms of energy in Ontario as a result of the power requirements of its primary industries: petroleum refining and petrochemical manufacture.

Twenty-nine buildings totalling 1.34 million sq. ft. and consuming 65.8 million equivalent kWh per year of gas and electricity were audited during the first year of the program: potential energy savings were estimated at 20%, or about $380,000 at 1990 rates. Sarnia/Lambton's second 'Cities Energy Forum', held late last year, sparked audit requests from 17 more building owners and managers, representing another $1.25 million in energy consumption and potential savings of $250,000.

Figures from the Toronto program indicate the average use across the 40 million sq. ft. of buildings is 42 kWh/sq. ft., 29 kWh of which is hydro. Gas use is equivalent to 9 kWh, and steam accounts for the equivalent of 4 kWh.

"The best way to economize is to cut hydro," Bull says. "Changing lighting, using energy-efficient motors and shifting the air-conditioning load to off-peak hours are some of the most obvious ways to conserve."

And he feels the Cities Energy Program offers owners and managers of smaller or older buildings a unique opportunity for saving energy and money.

"Although some owners can get the information the program offers because their buildings have sophisticated energy management systems, in most cases, this is the first time this type of information has been made available," he adds. ■

For a complete listing of the Cities Energy Forums in your area, see schedule on Page 16.

THANKS TO A STRONG COMMUNITY SPIRIT, AND A LITTLE HELP FROM THE MINISTRY OF ENERGY, AN HISTORIC LANDMARK IS BEING PRESERVED FOR FUTURE GENERATIONS

Upgrading a First Nations Landmark

by Chris Solomon

The Cape Croker Indian Reserve, located on the Bruce Peninsula on Georgian Bay, is home to about 680 Band members, and another 1,100 living off the reserve.

The community is currently in the middle of restoring an historic stone school building, part of the Ministry of Energy's First Nations Community Buildings Retrofit program. It's comforting to know our Band Council and community have taken an interest in restoring a part of our past.

The retrofit program is designed to encourage First Nations communities to upgrade the energy efficiency and comfort level in their community-owned buildings. It also provides the opportunity for community members to participate in these upgrades under the direction of experienced tradespeople, thereby learning through involvement.

Last summer, $34,700 was secured for exterior repairs to the school, such as rebuilding some roof areas, reshingling, installing a new steel insulated exterior door and thermo pane windows, upgrading wiring, furnace repairs and insulating the interior walls.

The school building was constructed in 1914-1915 through funding from the federal government. An unlimited supply of fieldstone was readily available, and the Niagara Escarpment Bluffs, just 500 yards away, provided all the necessary square edged cornerstones.

Local lumber was harvested and milled at our band-owned sawmill. Actual construction began the spring of 1915, providing work for 20-25 band members. It was the first band-owned building.

Finished in the fall of 1915, the main floor consisted of a 24 x 32 classroom, kitchen area, sitting room, principal's office, two washrooms and two entrances. All rooms were finished with strap and plaster, and colonial wainscotting throughout the entire main floor rooms. The upstairs consisted of two large bedrooms.

About 14 students, from grades one to eight, attended the first year. It was heated by wood stove and lit by kerosene lamps until hydro service was installed in the 1940s.

After 32 years of serving the community, the old stone school was scheduled to close in the spring of 1947. Its size and location no longer met the needs of the community, and funding for on-reserve schooling was allocated for a new and larger facility.

The building found life again in 1959 when it was converted to a trading post. It soon became a popular meeting place for community members to trade or sell their products.

But it was more than a trading post. The school building was also a place to share stories and tales of good times and hardship. After four years of operation, funding dried up, and the trading post closed down.

"One of the real tragedies of closing this trading post was our youth were being told about our culture and past," one respected Elder says. "Our Indian culture was being passed down to them as they listened to the tales and watched the handcrafts being made and traded, the way we as Indian people have done in the past."

The building was eventually reopened in 1964 as a rustic furniture factory, and closed again four years later.

In 1985, it was renovated into a crisis shelter for the homeless. The large classroom was converted into three bedrooms, while the upstairs area was closed off. Since that time, only minor repairs have been done through Band funding.

Since this old stone school building has become a landmark in our community, the Chippewas of Nawash Band Council have tried to obtain funding to restore it to its original condition. At this time, programs and organizations are trying to secure additional funding for its ongoing maintenance once it's restored.

Although the community has been behind the restoration project right from the start, it's obvious that the Ministry's involvement, along with its monetary support, has played a major role in extending the life of the building. ■

Chris Solomon is Housing Manager for the Chippewas of Nawash First Nation.

Education: Where It Begins

STUDENTS AROUND THE PROVINCE ARE LEARNING, FIRST HAND, THE BENEFITS OF ENERGY EFFICIENCY.

The findings of a recent energy audit at Marymount College, an all-girls' school in Sudbury, were not particularly surprising.

Measures such as setting thermostats 5°C lower at night, caulking around windows and turning down the temperature on hot water heaters, could result in energy cost savings totalling about $10,000 a year. But the audit attracted considerable attention because it was conducted by a group of the school's grade 9, 10 and 11 students.

As part of a 30-hour course called 'Savings Through Energy Management' or STEM, 20 Marymount students learned where to look for energy waste and how to calculate potential savings, conducted the audit and presented their findings at a meeting of the Sudbury and District Separate School Board. Five other high schools, located in Durham Region (just east of Toronto), Toronto and Sudbury also participated in the three-month pilot project co-sponsored by Ontario Hydro and the Ministry of Energy.

The program was launched five years ago in the U.S., and it is now offered in 60 high schools in New England, where it has led to a 37% reduction in energy consumption at participating schools. The pilot project in Ontario was very well received, with 92% of the student participants suggesting it be offered to other students, and some school boards considering recommending STEM as a credit course as part of a broader energy/environment awareness package.

In the first of five day-long sessions, students were given an overview of regional, national and global energy resources and use patterns; studied the potential for dollar savings through low- or no-cost measures; were introduced to dimensional analysis, energy audits, fuel to energy conversion calculations and conducted a building survey and walk-through.

Blueprints and measurements were used in the second session to calculate square-footage and, once heat-loss through the building envelope was determined, the student auditors were taught how to arrive at energy and fuel cost savings. Heating, ventilation in the building and calculation of a heat balance were the focus of the third day of classes, while lighting and electrical use, domestic hot water, renewable energy sources, design of the energy conservation plan and preparation of the audit presentation made up the fourth day.

The fifth day was set aside for

Students at Marymount College in Sudbury gather data for their energy audit. The audit showed $ 10,000 a year can be saved in energy costs.

review and a two-hour 'STEM energy auditor certification' examination. Students must not only pass the exam, but must participate significantly in completing the energy audit, which in the case of Marymount found energy wastage in four main areas: heating, lighting, water heating and the building envelope.

Their audit report pointed out that thermostats were vulnerable to occupant adjustment; heating equipment operated longer than necessary and in areas where it was not required, such as vestibules and lobbies; radiators were not operating at full capacity; the ventilation system used too much outside air and passive solar heating was not maximized. Setting thermostats 5°C lower at night would save 28,246 m^3 of natural gas or $5,100 a year, according to the students' calculations.

Lighting was found to be excessive in terms of wattage and hours used, while use of natural light was not optimized. Energy-inefficient lamps and lack of selective switching contributed further to the building's waste of hydro power. Replacing 40W bulbs with 34W bulbs; installing a timer as well as making better use of natural light in the cafeteria; replacing bulbs and reducing lighting levels in hallways and using desk lamps in classrooms occupied only by the teacher were measures students found could save about 19,500 kWh, or $1,560 a year.

A potential savings of $500 or just under 900 m^3 of natural gas each year could result from correcting water-heating problems such as higher-than-necessary water temperatures and missing insulation on hot water pipes. Overcapacity for water heating and storage was also identified as a source of energy waste.

Low- and no-cost improvements to the building envelope included using blinds and curtains to help insulate the school and applying new weatherstripping or caulking where needed.

Angela Gunville, a grade 11 student, noted in her summary of the program that implementing these few ideas would save a considerable amount of money, which could then be used to finance the more costly recommendations. Further savings generated could go towards establishing a bursary for students undertaking post secondary education in math or science. Other general recommendations included educating staff and students in energy conservation and developing a conservation incentive program.

These suggestions indicate the program was about much more than cutting energy costs, as do some of the comments in Gunville's summary. "As can be seen, the program covered a variety of subjects. It gave the students many opportunities to explore different career options. It forced us to do logical mathematical equations that wouldn't normally be part of the curriculum. Most importantly though, it was a remarkable awareness-raising endeavour that I'm sure will not be forgotten by the students involved.

"It was beneficial in that we were reminded, with facts and figures, that the resources we take for granted won't always be there, and it is up to us not only to preserve them, but to find new ways to save energy in our homes, schools and places of work." ■

CITIES ENERGY FORUMS

Cities Energy Forums are being held in various areas around the province. For exact dates and locations, contact the host organization in your area:

Area	When
Hamilton & District Chamber of Commerce (including Brantford) (416) 522-1151 FAX: (416) 522-1154	*Spring*
City of Kingston (613) 546-4291 FAX: (613) 546-5232	*Fall*
Kitchener/Waterloo Chamber of Commerce (519) 576-5000 FAX: (519) 742-4760	*Spring*
London Chamber of Commerce (519) 432-7551 FAX: (519) 432-8063	*Winter*
Niagara Falls Chamber of Commerce (combined with St. Catharines) (416) 374-3666 FAX: (416) 374-2972	*Fall*
North Bay & District Chamber of Commerce (705) 472-8480 FAX: (705) 472-8027	*Spring*
Sault Ste. Marie Chamber of Commerce (705) 949-8231 FAX: (705) 759-8166	*Spring*
Scarborough Chamber of Commerce (416) 439-4140 FAX: (416) 439-4147	*Winter*
Sudbury & District Chamber of Commerce (including Nickel Centre, Onaping Falls, Rayside-Balfour, Valley East, Capreol and Walden) (705) 673-7133 FAX: (705) 673-2944	*Fall*
Thunder Bay Chamber of Commerce (807) 622-9642 FAX: (807) 472-7752	*Spring*
Timmins Chamber of Commerce (705) 360-1521 FAX: (705) 350-1193	*Fall*
Windsor Chamber of Commerce (519) 256-2641 FAX: (519) 969-7334	*Winter*
Peterborough Chamber of Commerce (705) 748-9771 FAX: (705) 743-2331	*Fall*
Sarnia-Lambton Chamber of Commerce (519) 336-2400 FAX: (519) 336-2085	*Fall*
Burlington Chamber of Commerce (including Oakville, Milton) (416) 639-0174 FAX: (416) 333-3956	*Spring*
BOMA Toronto (416) 596-8065 FAX: (416) 596-1085	*Winter*
BOMA Ottawa-Carleton (613) 232-1875 FAX: (613) 563-3908	*Fall*
Northeastern Ontario Chambers of Commerce *(including Chapleau, Cochrane, Englehart, Hearst, Iroquois Falls, Kapuskasing, Kirkland Lake, Temagami)* (705) 360-1521 FAX: (705) 350-1193	
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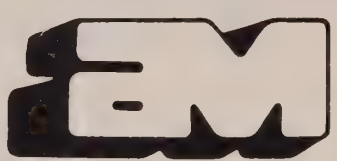

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Learning and Sharing Energy-Efficient Technology

THE MINISTRY PROMOTES ENERGY EFFICIENCY THROUGH A WIDE RANGE OF TRAINING AND TECHNOLOGY TRANSFER PROGRAMS.

Not too long ago, it wasn't that easy to find the right training programs that focussed on energy efficiency.

Now, thanks to partnership initiatives between the Ministry of Energy and others, a variety of training opportunities are offered across the province for building managers and operators, and for students wanting to enter that field.

Through its Buildings Training and Technology Transfer program, the Ministry promotes energy-efficient construction, operation and maintenance of buildings and their systems.

For instance, more than 20 years ago, Seneca College in Toronto, along with Building Owners and Managers Association (BOMA) Toronto, developed a Building Environmental Systems (BES) certificate program.

"BES is specifically directed toward training building operators, and features the principles and practices of energy-efficient operation of buildings," says Bill Humber, Program Area Chair. "The Ministry saw the need to address the fact that more highly educated building operators could assist in a potential energy savings of up to 20% in buildings across Ontario."

In 1988, the Ministry and Seneca collaborated to develop a pilot program within BES on Energy Efficiency in Large Buildings. It covers energy efficiency as it relates to building management and application, heating and cooling, air handling, lighting and electrical systems, and building control systems.

The program has earned such high marks that in 1989, Seneca College received an award for Outstanding and Creative Programming from the Learning Resources Network (LERN).

"It has been a remarkably successful collaborative relationship between Seneca and the Ministry," Humber says. "Resources for program development are limited, and being able to establish this kind of partnership with

Training opportunities, such as the program offered at St. Clair College, Chatham Campus, are available across Ontario.

the Ministry allowed us to upgrade our curriculum materials and market the program throughout the community college system in Ontario."

Seneca offers the training package and materials to all colleges throughout the province, and three — St. Lawrence in Kingston, Mohawk in Hamilton, and Georgian in Barrie — are currently offering the BES program. At least 12 colleges have used the information in one form or another.

To Bill Humber, it's just the beginning.

"With Ministry support, we want to get our program and energy training into every college in Ontario," he adds.

Meantime, St. Clair College's Thames Campus in Chatham has offered, since 1984, a three-year Mechanical Engineering Technology Energy Management diploma program.

It's an engineering technology program that caters to a higher level of professional. Components incorporate the building and mechanical systems design function as well the economic analysis of energy efficiency measures.

The program is not limited to buildings, but covers industrial processes and the entire thermodynamics of energy use. Clearly, the program meets an important need in the area of energy efficiency.

In fact, when enrolment numbers dropped to the point where the program was on the chopping block, a concerned group of individuals from within the college, local business and industry got together to brainstorm.

The group came up with a 'Be Part Of The Solution' promotional campaign that incorporated a stunning photo of the globe with an hour-glass. It was on posters and the cover of the program brochure, and its appeal has had a strong impact on enrolment numbers.

"We used to get maybe 25 applicants a year, but when this new campaign was introduced last year, we received over 100 applicants for a program that can only accept 60," says Bill White, program coordinator. "We already have over 60 applicants for next September's semester."

But White gives only part of the credit for the major turnaround to the promotional campaign.

"So much of our success is based on a unique partnership between the Ministry of Energy, Ontario Hydro, Union Gas and, of course, the college," White adds. "The Ministry was the catalyst that brought the partnership together, but all four participants have worked diligently to promote and support the program.

"We're proud of the partnership, and having a vehicle for the 1990s certainly helps," White concludes. "But the fact is, the underlying need for this program is there, and we knew the college couldn't do it alone. Without the support of the Ministry, Ontario Hydro and Union Gas, we could have lost it."

The Ministry understands that energy savings of up to 20% can be achieved if the right education and training is made available to the very people who can make it happen. That's why the Ministry has trained 18 instructors at colleges around the

province to teach energy efficiency courses.

If you're interested in training opportunities in energy efficiency, call your local community college to see if they offer it and, if they don't, encourage them to do so.

URBAN INNOVATIONS

In addition to the energy efficiency programs offered through the community college system, the Ministry also sponsors an annual competition for energy-efficient residential design called 'Urban Innovations Design'. Formerly known as the R-2000 Student Design Challenge, the competition is open to all full-time architecture and architectural technology students enrolled in Ontario universities and colleges.

Since its birth seven years ago, it has attracted almost 2,000 entrants.

Last year, a team of architectural students from Algonquin College in Ottawa shared the first prize of $10,000.

"The basic focus of our project was to design multi-unit residential accommodation that was energy-efficient, environmentally sensitive and addressed social housing issues," says Bill Robertson, a graduate of Algonquin's Architectural Technician/Technology program and part of the winning team which also included Michel Chenier, Darrin Newnham and Razmik Zargarian.

"We came up with a project that was not single family accommodation, but was designed instead for composite families, unrelated individuals and groups."

The flexible nature of the concept was to provide a comfortable structure in which groups and individuals could create their own customized living environment.

Natural gas was the energy source for space heating, while a heavy emphasis was placed on passive solar gains to diminish fuel consumption.

"We had a substantial array of photovoltaic collection modules on the roof to supply electricity for hot water and interior lighting," Robertson explains. "We also used a combination of various types of experimental equipment, fibre optic lighting for the hallways, low load requirement locations, and even experimental building materials such as phase-change gypsum."

The project will be tested and monitored on an ongoing basis.

"I've personally made an ongoing study since graduation of the different types of solar-related systems," he continues, "and I've found the photovoltaic aspect has really taken off in the past year. I'm sure elements of the project will continue to develop and be applied."

Robertson is currently seeking employment in an area where he can apply his building science and residential construction skills.

" The competition was a fantastic opportunity to conduct fairly intensive and time-consuming research over a four-month period," Robertson adds. "And, of course, it's always more satisfying in retrospect when you've won the competition." ■

Institutions of Higher Energy Efficiency

EVEN WHEN IT MAY NOT BE ON THE CURRICULUM, WE'RE LEARNING MORE ABOUT ENERGY EFFICIENCY AT SOME OF ONTARIO'S EDUCATIONAL INSTITUTIONS.

A $560,000 lighting retrofit at three campuses of Georgian College and a $2.8-million groundwater heating and cooling system at Carleton University are just two projects that have received assistance from the Ministry of Energy's Institutional Energy Management Program.

Developed to show that energy performance in buildings and facilities can be improved by at least 20%, the program encourages energy-efficient design and operation in institutional facilities. It helps institutions plan strategies for energy reduction and provides advice on Ministry and utility incentive programs. More specifically, it offers energy audits and technical help; financial assistance for retrofits; advice and assistance for new building design; funding to demonstrate new technology in building systems; and monitoring and reporting on energy use.

The major energy use at educational institutions is lighting, says Georgian College's director of physical resources, Keith Fairbrother, admitting that his college — with lights on from 7 a.m. to 11 p.m. most days — is no exception. And since the Barrie campus already has an energy management system, and the facility in Orillia is the first Ontario college building to have a ground-source heat system, tackling lighting was the obvious next step in the college's efforts to conserve energy.

No light escaped the retrofit: classroom, exit, corridor, stairwell pot lights and exterior lights were all replaced, altered or fitted with new controls. High-pressure sodium lights in parking lots and streets cut energy demands for exterior lighting by 50%, and new LED exit signs use only one-and-a-half watts as compared to conventional signs, which are lit by two 25W bulbs. And an alteration like improving the reflector and using energy-efficient ballasts and lamps in fluorescent units means two tubes provide the same light as four did previously.

Motion and heat sensors automatically turn lights off in vacant class-

The Ministry of Energy and the Ministry of Government Services have teamed up to ensure Ontario government buildings adopt energy-efficient measures.

It's part of the Government Energy Management program, which encourages energy-efficient design and operating practices in government facilities. And it's an important element in Ontario's commitment to establish an energy-efficient Ontario.

To date, more than 900 government buildings have gone through the energy audit process. The Ministry of Energy is offering assistance to government departments to:

- establish consistent energy monitoring for all government buildings.
- do feasibility studies in advance of comprehensive energy retrofits.
- access innovative financing to fund the retrofits.
- assist in implementing new, efficient building design and technology innovations.

A target of 20% improvement in the energy performance of government buildings by the year 2000 has been established. To meet this target, about $100 million will have to be invested in energy retrofits of hundreds of buildings. Savings should be $20 million a year.

Since the government wants to limit its borrowing, these investments can be made so they can pay for themselves out of savings. ■

rooms, and current-limiting devices reduce energy needs for lighting in corridors by 30 to 50%. In lobbies and stairwells, 150W incandescent pot lights were replaced with 13W compact fluorescents.

Incentive rebates from Ontario Hydro brought costs down by $225,000, and about $180,000 a year will be saved thanks to the 439kW demand reduction, which translates into a 22% cut in annual energy consumption. Fairbrother estimates the payback period should work out to about two years after factoring in savings and rebates.

But the finances are simple when compared with actually implementing the retrofit — the largest of its kind in Barrie and a first for Ontario colleges — at a large institution like Georgian College (which includes 820,000 sq. ft. of space at campuses in Owen Sound, Barrie and Orillia). So many people are affected that careful planning is vital.

"You have to think twice before you jump into it," says Fairbrother, explaining that a year was spent on experiments, including prototype testing in classrooms, to determine the pros and cons of devices and to ensure lighting quality was maintained.

"After the entire retrofit was complete, we heard nothing but compliments. I can hardly believe the quality is there and the savings are there too."

Carleton University's efforts under the program were both more spectacular and less visible. The spectacular aspect is that the $2.8-million groundwater heat pump system, one of the largest of its kind in North America, reduces the university's $2.25-million annual energy bill by 20% for a savings of $450,000. Yet despite its obvious impact on the bottom line, the physical presence of the system that provides heating and cooling to nine buildings is not at all obvious, since it's buried deep underground or hidden in mechanical equipment rooms.

Phase One, which was completed in February, 1991, was funded in part by Energy, Mines and Resources' Canada Centre for Mineral and Energy Technology (CANMET) which contributed more than $450,000, while the Ontario Ministry of Energy and Ministry of Colleges and Universities provided $150,000 and $94,000 respectively.

Environmentally sound and cost-efficient, the system takes advantage of the warm water flowing through the layers of sedimentary rock beneath the campus. In winter, five 120-meter production wells bring this 9.5°C water to the surface where it is drawn off in heat exchangers and heat pumps and transferred to the university's heating system. In summer, cooling is achieved by reversing the process, transferring water back to the sub-surface aquifer through re-injection wells.

The nine buildings — previously heated and cooled by a combination of electricity and steam from a central heating plant fueled by oil and natural gas — will now reduce its gas use by about 3 million m^3 a year, according to Bryan Beazer, physical plant director at the university.

Subsequent phases of the project, to be completed over the next decade, will see all 26 buildings on the campus hooked up to the system, with energy savings estimated at $1 million annually.

"Universities are pioneering new technology every day, and the groundwater project is just one example of this," says Carleton president Robin Farquhar. "What we learn here may eventually be applied elsewhere. And what's more, I think this is a good example of what can happen when we in the university are able to combine our expertise with the resources of government. In the end, everyone comes out ahead." ■

Seeking a Competitive Edge

ENCOURAGING ENTREPRENEURSHIP THROUGH RESEARCH AND DEVELOPMENT MAY HOLD THE KEY TO ONTARIO'S ECONOMIC FUTURE.

One of the most effective ways for Ontario business to compete successfully in the global marketplace is to invest in research and development.

The Ministry of Energy, through its EnerSearch® program, assists Ontario manufacturers of innovative energy products by encouraging research and development activities.

The program is having a remarkable impact by providing opportunities for energy-related entrepreneurship and new manufacturing business. In fact, since 1986, 121 Ontario companies have received EnerSearch® Program contributions totalling $14.5 million towards a total research effort of $54.4 million in energy technologies.

This multi-year program assists the private sector in research, development, testing and initial technical demonstration of new energy technologies in Ontario. The maximum contribution to any one project is $500,000, and the maximum total government contribution is 50% of eligible costs.

There have been a number of success stories where Ontario companies have reaped the benefits of the EnerSearch® program.

JOMITEK FINETUNES ELECTRICAL LOADS

For instance, Ottawa-based Jomitek Inc. received an EnerSearch® award of $130,000 to develop load management electronics to control residential water

Research and development of energy-efficient technologies, such as the use of photovoltaic collection modules, receives considerable support from Ministry programs like EnerSearch®.

heaters, appliances and electric space heaters. The company designs, manufactures, installs and services electrical power management systems.

"Research and development funding by the Ontario Ministry of Energy EnerSearch® program has helped Jomitek develop innovative instrumentation and energy control products," says Larry Fish, president of Jomitek. "Thanks to the Ministry, we have become a respected leader in electrical power conservation technology."

The technology controls and monitors electrically- operated equipment using an inexpensive radio-controlled switch and a load monitoring device. Load control commands generated by an Expert System computer program are issued by radio from the electric utility control room.

The system generates individual demand curves so that the controller can select only those appliances that contribute to the specific peak at a given time.

In cooperation with Cornwall Electric and Atikokan Hydro Electric, Jomitek's technology has been installed and is expected to reduce electric demand in these two communities by up to 10% and achieve energy savings of up to five per cent for the utilities.

In Atikokan, the load management strategy will control automobile block heaters and freezers, as well as electric equipment at the town's major industrial facilities. This translates into an electric energy savings of up to $300,000 for the town.

"The new load management technology has the potential to make Atikokan electrically efficient in terms of electricity distribution," Fish says. "And, it could become a model for homeowners and building operators in other northern communities, as well as remotely located mines, sawmills and lumber operations."

POWERLASERS STREAMLINES PRODUCTION

Another recipient of EnerSearch® support is Powerlasers Limited of Waterloo. It received $473,000 to develop a laser-based robotic manufacturing cell. In cooperation with a major automotive manufacturer, the technology will perform automated cutting, welding and heat treatment tasks for metal car parts.

A typical car consists of 20,000 parts. One way to achieve manufacturing efficiency is by producing the parts in near-perfect shape so that minimal further machining is required.

Powerlasers' manufacturing cell combines up to four industrial lasers, a robot and a CAD/CAM system to fabricate automotive parts from engineered drawings to final product in a continuous operation.

"Laser use is increasing in modern industrial manufacturing because of its high production speed, flexibility and accuracy," says Dr. Walter Duley, president of Powerlasers Limited. "The laser can be easily integrated into fully automated production lines."

The laser-robotic manufacturing system can be customized for specific end-use in the aircraft and aerospace industry, plastics industry, for heat treatment and tool and die applications.

The successful completion of this project is anticipated to result in new jobs and metal fabrication process energy savings of up to 90%. Other benefits include improving product quality and reducing industrial scrap and production downtime.

EnerSearch® continues to play a key role in supporting and encouraging research and development among Ontario's industrial and manufacturing sector. That commitment is resulting in development of new energy-efficient technologies and the creation of new jobs throughout the province.

It is a prime example of Ontario's Green Industry Strategy at work — a strategy that seeks to make Ontario a leading producer and exporter of environmental goods and services. ■

Bring on the New Technology

AFTER THE R&D STAGE, MINISTRY PROGRAMS ADDRESS THE NEXT HURDLE-GETTING NEW ENERGY-EFFICIENT TECHNOLOGIES ONTO THE PLANT FLOOR.

It's always a challenge to introduce new technologies into the marketplace. That's why the Ministry offers a range of programs and services to encourage Ontario's industries to invest in cost-effective energy-efficient technology and processes.

The Industrial Process Equipment Demonstrations program, for instance, encourages the advancement of emerging energy-efficient technologies.

Here's how it works: The Ministry shares the cost of initial demonstrations to prove the performance, energy impact and other benefits of the latest technologies in new process applications. This helps to encourage the adoption of these technologies by other companies.

Those who qualify are Ontario-based companies which plan to install:

1. Demonstrable technologies which are advanced, technically-proven, commercially-available technologies that improve the energy efficiency of equipment or production processes.

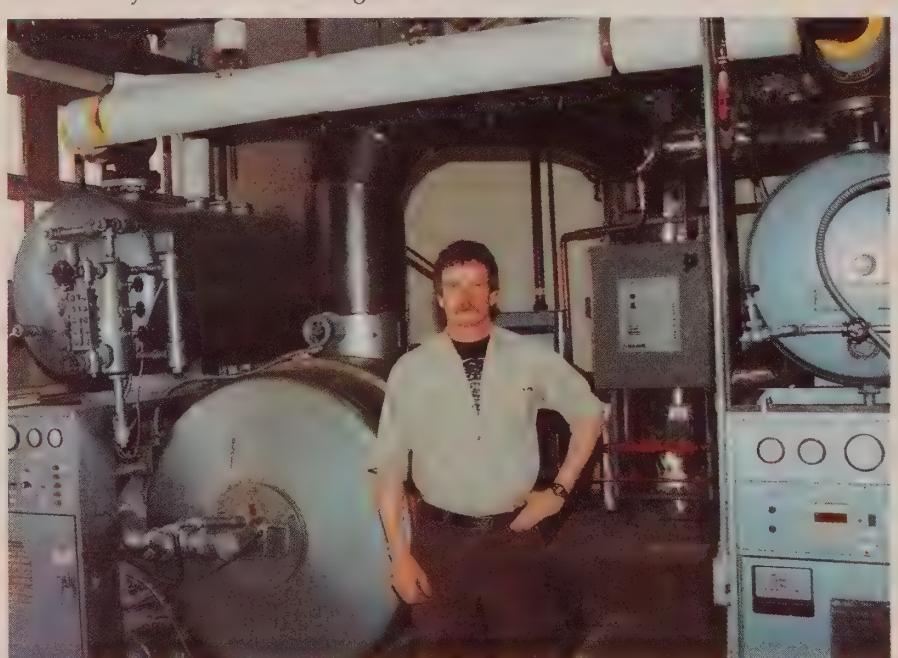
2. Technologies which have not yet been demonstrated in Ontario and which are in the early application stages.

MEET

In addition, the Ministry's Market Entry Efficiency Technologies (MEET) program gives some manufacturers a head start.

The program's objective is to accelerate market acceptance of new energy-efficient technologies manufactured by Ontario companies. Regular competitions award incentive grants to reduce the risk to first-time industrial buyers of new energy efficiency products.

The winning products are allocated financial assistance of up to 50% of first-year sales up to $500,000 or five plant site installations, whichever is lesser.



Dale Bursey of Sudbury Laundry & Drycleaners, with boilers in front and water heaters behind.

Ron Polidori, Marketing Manager for Miura Boiler Company Ltd. of Brantford, can't say enough about the MEET program.

"It has allowed us to get five of our new low nitrous oxides boilers into the market, where they are showcased for potential customers", Polidori says. "Canadian companies are often hesitant to purchase new technology, but now, we have four customers with our boilers in place."

MEET provided incentive grants amounting to 50% of the capital cost for Miura's customers, Johnson & Johnson Medical Products in Peterborough, Sweetripe Drinks Inc. of Mississauga, and Ford Motor Company in Oakville, to purchase the boilers as part of their process equipment upgrade initiatives.

On average, the anticipated energy savings will be around 10%.

One of the stipulations of the program is that potential customers may view the new products in use.

The Ministry of Energy conducted an extensive investigation into Miura and two other manufacturers chosen from eight entries.

"They examined our product and financial status — everything from A to Z," Polidori says. "By being one of the accepted manufacturers to come into the MEET program, right away, customers know we have something good to offer."

The high-efficiency LX series boilers from Miura produce steam and hot water for industrial and commercial applications. Because of their low nitrous oxide emissions, Miura's LX boilers are environmentally acceptable. Also, the boilers are compact (only 32" wide) and can fit through any standard door. This saves in installation costs.

"Export sales are definitely going to continue to be a large part of our business, especially with the LX boilers selling so well in the California market, which has the most stringent emissions regulations in North America," Polidori adds. "The boilers will continue to be manufactured in Canada."

For Dantec Systems of Cambridge, the MEET program meant the installation of its computerized drying control system at the Forwell Blair plant.

"We have nothing but excellent prospects for our Dryer Master product," says Dr. Gerry Sullivan, President and CEO of Dantec Systems. "This state-of-the-art product provides powerful control capabilities, integrated with its moisture sensing functionality, to provide a complete system for monitoring and managing the industrial drying operation."

Customers in industries where energy is used to dry large volume product, and where over-drying results in significant energy waste, can benefit from this system.

The principal commercial risk facing this product is marketplace scepticism regarding its ability to do what is claimed.

"Our absolute number one resistance in bringing Dryer Master to the market is getting the initial demonstration sites going," Dr. Sullivan says. "To many customers, it's an unproven technology. The ability to establish, with the help of the MEET program, a demonstration site where the technolo-

gy can be shown to work will be of great assistance in overcoming scepticism among potential customers."

The ability to use information from the Forwell Blair plant will also be very valuable.

For Miura Boiler Company and Dantec Systems, the partnership with the Ministry of Energy under its MEET program has firmly placed both companies on the road to success.

IESP AND RETROFIT GRANTS

Many of Ontario's industrial plants are currently working with equipment and processes that are up to 20 years old. Although much of that existing equipment was built to last a long time, the Ministry recognizes that it may not meet today's energy-efficient needs.

There is a need to upgrade industrial equipment and production processes in this province to stay competitive, and the Ministry's Industrial Energy Services Program (IESP) and Industrial Retrofit Grants Program are available to assist Ontario industry.

IESP was developed to help Ontario's industrial sector identify ways to reduce its energy costs and increase its energy efficiency. Through the audit process, a full range of energy-efficient opportunities are identified in individual plants. The Ministry also offers incentives through its Indus-

trial Retrofits Grants. These grants assist industry with the purchase and installation of non-electrical energy-efficient equipment.

Working in concert with the Ministry's grant program is Ontario Hydro's Accelerated Payback program, which offers funding for electrical equipment and processes.

One family-owned business, Sudbury Laundry and Drycleaners Ltd., has taken the initiative to become energy efficient. Operating five drive-by stores along with its main plant and employing over 50 people, this firm has always been interested in the latest technology and energy efficiency. It was the first laundry in Northern Ontario to install highly efficient tumble dryers and dry cleaning equipment.

"We originally had no plans to implement this type of retrofit, although it was always in the back of our minds," says Dale Bursey, project manager for Sudbury Laundry.

Early in 1991, the company requested an energy audit of its plant be conducted under IESP. The audit highlighted the need to upgrade the steam and water systems and, with the results, Bursey moved quickly to apply for an Industrial Retrofit Grant.

The company received a grant amounting to 30% of the cost to buy and install smaller, more efficient reconditioned natural gas boilers, plus a computerized energy monitoring and control system.

"Without the Ministry's guidance and monetary help, we couldn't have replaced our existing boilers because the money's just not there, especially in these economic times," Bursey adds.

The retrofits are estimated to reduce the company's energy costs by $29,500 a year.

Another industrial success story is Specialty Porcelain Company Limited in Oakville.

The company approached the Ministry concerning its pickling operation. Ontario Hydro and Union Gas were called in to determine what Specialty Porcelain could save by installing a new natural gas boiler and plate coils in the pickling process.

"We had been on hydro since the business started 16 years ago, and we often thought we should get onto gas because it's more efficient," says Grant Bennett, co-owner of the company. "Hydro costs back then were okay, but rate increases in recent years, especially the 13% increase just this past January, really moved us to convert."

Specialty Porcelain received a grant to proceed with the purchase and installation of the necessary energy-efficient equipment, and expects to reduce its energy bill by one-half.

"With the economic squeeze in the past year, and for the next year or two, we really have to look at everything," Bennett adds. "If it wasn't for the Ministry's grant, we may not have implemented the retrofits so soon."

With the cooperative efforts between the Ministry of Energy and Ontario Hydro, our industries have access to considerable technical and financial assistance to become energy-efficient and more competitive. ■

Partners wanted

Our contribution:

Ontario is moving in new energy directions towards an energy-efficient society. It is something we must all do together.

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Here is a brief look at some of what we offer:

To Industry. At no cost, we will audit plant energy use to identify opportunities for savings and make suggestions.

In some special cases, we will provide grants of up to $600,000 for retrofits. To encourage first-time users of new energy-efficient products, we will hold biannual competitions awarding up to $500,000 to winning proposals.

To Communities. We are working with communities and owners of private/commercial buildings across the province to encourage effective energy management. We also make available a wide variety of 'how to' publications to the general public.

To Public Institutions. We are partnering with public institutions like hospitals and schools, and with municipalities and other provincial ministries, to encourage energy efficiency.

Some of these programs offer financial assistance from 50% to 75% for energy audits and retrofits.

To The Innovators. The educators, the trainers, the researchers and the energy entrepreneurs. To you, we offer an innovative menu of incentives ranging from the sharing of experience to cost-sharing funding of up to $500,000.

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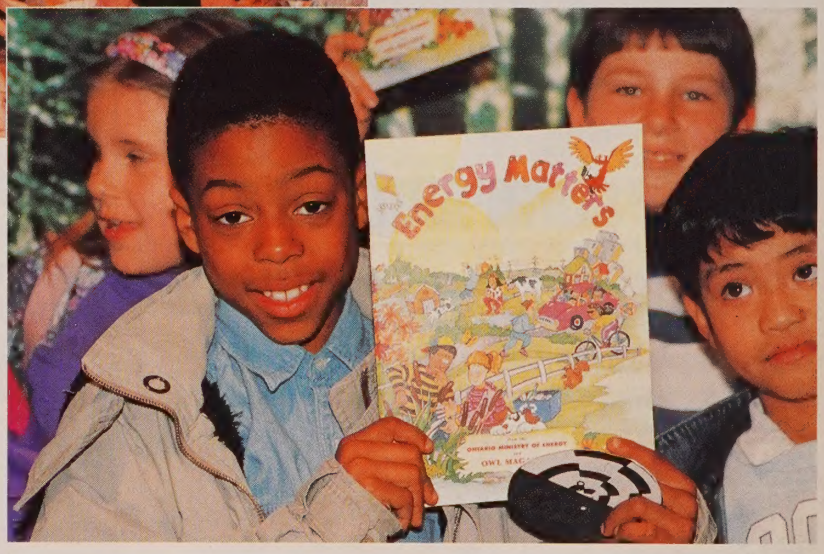

In May, 1992, the Ontario Ministry of Energy celebrated the release of a new publication, "Energy Matters" — a 36-page, fun-filled activity book geared to kids aged six to 12.

About 300 Grade Four students joined the Acting Minister of Energy, Brian Charlton, at Harbourfront in Toronto to help launch the book.

"Energy Matters" was co-produced with the Young Naturalist Foundation, publishers of the highly respected OWL and Chickadee children's magazines. The games, puzzles, experiments and activities are designed to make energy interesting, entertaining and understandable.

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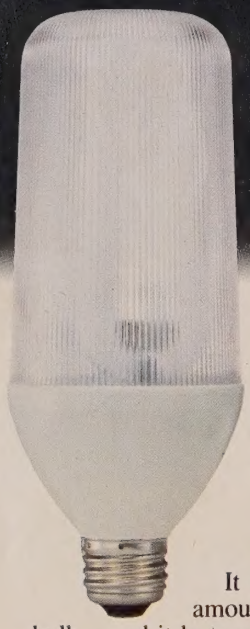

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Philips SL*18 Earth Light is truly the latest advance in lighting technology. It uses only 18 watts to produce the same amount of light as a 75 watt incandescent light bulb – and it lasts more than ten times longer. The result is a tremendous saving in electricity ($35.00 on energy costs based on 6 cents/kwH); so much that, over the life of the lamp, it pays for itself.

And there's more good news. The enormous energy savings add up to vital environmental savings.

Just one Philips SL*18 Earth Light operated over its lifetime will eliminate the need to burn 500 pounds of precious coal, or a barrel of oil, for the generation of electricity. This, in turn, eliminates over 1500 pounds of greenhouse gas emissions that contribute to global warming, as well as 20 pounds of acid rain producing emissions.

Now you know why this amazing high-technology lamp from Philips; the lamp that pays for itself, has earned the name "Earth Light".

Send a FAX to the Philips Lighting team at Dept. SL, 1-800-668-9020. We'll send you full information on how you can put it to work to help save – for yourself and the environment!

Philips - *The visible difference!*

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